

3

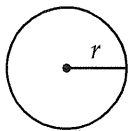


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Math Test --- No Calculator

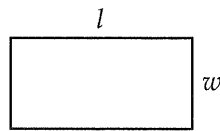
25 Minutes, 20 Questions

Reference

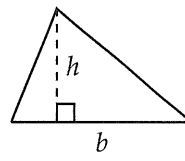


$$A = \pi r^2$$

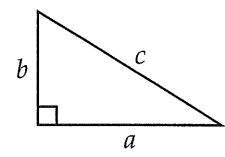
$$C = 2\pi r$$



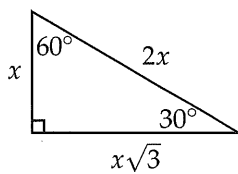
$$A = lw$$



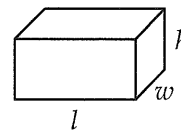
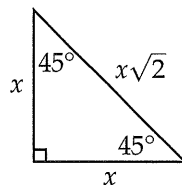
$$A = \frac{1}{2}bh$$



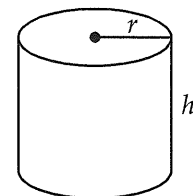
$$c^2 = a^2 + b^2$$



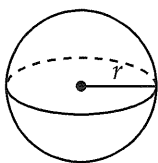
Special Right Triangles



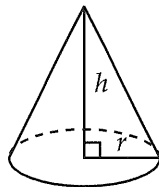
$$V = lwh$$



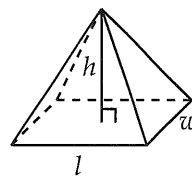
$$V = \pi r^2 h$$



$$V = \frac{4}{3}\pi r^3$$



$$V = \frac{1}{3}\pi r^2 h$$



$$V = \frac{1}{3}lwh$$

There are 360 degrees of arc in a circle.

There are 2π radians of arc in a circle.

The sum of the measures of the angles of a triangle, in degrees, is 180.

3



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1

Which of the following expressions is equivalent

to $\frac{\frac{x}{y}}{\frac{y}{z}}$?

- A) $\frac{x}{z}$
 B) $\frac{z}{x}$
 C) $\frac{xz}{y^2}$
 D) $\frac{y^2}{xz}$

2

A movie rental service charges \$15 as a monthly subscription fee and \$3 per movie rented. If Alex rents x movies per month from this service, which of the following expressions gives the total amount, in dollars, he spends on movie rentals in one year?

- A) $12(18x)$
 B) $15 + 12(3x)$
 C) $12(15) + 3x$
 D) $12(15 + 3x)$

3

If $\frac{x^{a^2} \cdot x^{b^2}}{x^{2ab}} = x^{25}$, $x > 1$, which of the following could be the value of $a - b$?

- A) 3
 B) 4
 C) 5
 D) 6

4

$$v = 100 + 25h$$

The daily number of visitors v to a store that is open for h hours each day can be modeled by the equation above, where $h \geq 1$. According to the model, how many more daily visitors can the store expect if it were open for two more hours each day?

- A) 25
 B) 50
 C) 100
 D) 200

5

If $mb < 0$, then the line whose equation is $y = mx + b$ cannot contain which of the following points?

- A) $(-1, 0)$
 B) $(0, 1)$
 C) $(1, 0)$
 D) $(0, -1)$

6

$$\begin{aligned} -3x + 2y &= 5 \\ -9x + 6y &= 18 \end{aligned}$$

The system of equations above has how many solutions (x, y) ?

- A) Zero
 B) One
 C) Two
 D) More than two

3



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7

If $\frac{x+x}{x \cdot x \cdot x \cdot n} = 1$, where $n \neq 0$, then $n =$

- A) $\frac{1}{x^2}$
- B) $\frac{2}{x^2}$
- C) $\frac{x^2}{2}$
- D) $2x^2$

8

Which of the following functions has a graph in the xy -plane that does not cross the x -axis?

- A) $f(x) = 1 - x^2$
- B) $f(x) = |x - 1|$
- C) $f(x) = (x - 1)^2 + 1$
- D) $f(x) = x^3 - 1$

9

Which of the following is equivalent to

$$\left(\frac{1}{xy}\right)(2x + 2y)?$$

- A) $\frac{1}{x} + \frac{1}{y}$
- B) $\frac{2}{x} + \frac{2}{y}$
- C) $\frac{2}{x} + \frac{2}{xy} + \frac{2}{y}$
- D) $2x^2y + 2xy^2$

10

$$\frac{1}{3}x + \frac{1}{6}y = 5$$

$$\frac{3}{5}x + \frac{1}{5}y = -4$$

Which of the following ordered pairs (x, y) fulfills the system of equations above?

- A) $(-50, 130)$
- B) $(2, 26)$
- C) $(5, 20)$
- D) $(20, -10)$

11

A car dealer has a budget of \$12,000 to advertise on television and on radio. A television ad costs \$800 and a radio ad costs \$300. The dealer wants to run no more than 24 radio ads. The total number of ads must be at least 3 times the number of television ads. Which of the following systems of inequalities represents the conditions described if x is the number of television ads and y is the number of radio ads?

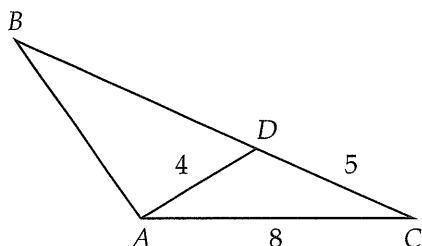
- A) $800x + 300y \geq 12,000$
 $y \geq 24$
 $x + y \leq 3x$
- B) $800x + 300y \geq 12,000$
 $y \geq 24$
 $x + y \leq 3y$
- C) $800x + 300y \leq 12,000$
 $y \leq 24$
 $x + y \geq 3x$
- D) $800x + 300y \leq 12,000$
 $y \leq 24$
 $x + y \geq 3y$

3



3

12



In the figure above, the measure of $\angle ABC$ is equal to the measure of $\angle CAD$. What is the value of $\frac{AB}{BC}$?

value of $\frac{AB}{BC}$?

- A) $\frac{1}{2}$
- B) $\frac{4}{5}$
- C) $\frac{5}{4}$
- D) $\frac{5}{8}$

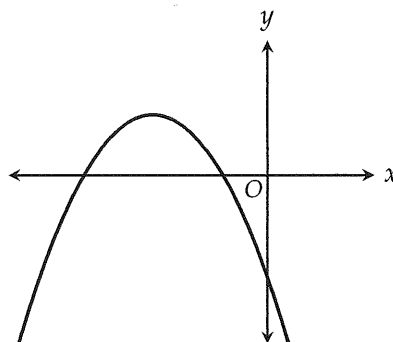
13

$$\frac{4i}{i-1}$$

Which of the following is equivalent to the expression above? (Note: $i = \sqrt{-1}$)

- A) $-2 + 2i$
- B) $-2 - 2i$
- C) $2 + 2i$
- D) $2 - 2i$

14



A parabola, defined by $y = a(x - b)^2 + c$, is graphed in the xy -plane above. Which of the following is true about the parabola with equation $y = c(x + a)(x + b)$?

- A) The graph opens upward and has two negative x -intercepts.
- B) The graph opens upward and has two positive x -intercepts.
- C) The graph opens downward and has two negative x -intercepts.
- D) The graph opens downward and has two positive x -intercepts.

15

$$p(x) = (3x^2 - 5)(x + k) - 20$$

In the polynomial $p(x)$ defined above, k is a constant. If x is a factor of $p(x)$, what is the value of k ?

- A) -6
- B) -4
- C) 2
- D) 4

3



3

16

Matt collects rare baseball cards. Each pack of baseball cards he buys contains 12 cards, two of which are rare. He currently has 40 rare cards. If his goal is to have 100 rare baseball cards, how many more packs of baseball cards will he have to buy?

17

If f is a function defined by $f(x) = \frac{2x - 5}{6}$, for what value of x is $f(x) = \frac{1}{2}$?

18

If $\frac{3c}{d} = 4$, what is the value of $\frac{60d}{c}$?

19

$$y = x^2 - 10x + k$$

In the equation above, k is a constant. If the equation represents a parabola in the xy -plane that is tangent to the x -axis, what is the value of k ?

20

What is one possible solution to the equation

$$\frac{22}{x+3} - \frac{6}{x-2} = 1?$$